

Appl. No. 10/016,586
Reply to Office Action of February 17, 2004

REMARKS

This amendment is responsive to the Office Action dated February 17, 2004. Applicant has not amended or added any claims. Claims 10-32 have been withdrawn pursuant to Applicant's Response to Restriction Requirement filed on November 7, 2003. Claims 1-9 are pending.

Claim Rejections Under 35 U.S.C. § 102

In the Office Action, the Examiner rejected claims 1, 4 and 6 under 35 U.S.C. § 102(b) as being anticipated by Gustavson et al. (U.S. Pat. No. 6,005,370). The Examiner also rejected claims 1, 4 and 6 under 35 U.S.C. § 102(b) as being anticipated by Chang et al. (U.S. Pat. No. 5,447,522). Applicant respectfully traverses these rejections.

For a claimed invention to be anticipated by a cited reference, the cited reference must disclose each and every element of the claimed invention. E.g., Trintec Indus. Inc. v. Top-U.S.A. Corp., 63 USPQ2d 1579, 1599 (Fed. Cir. 2002); Lewmar Marine, Inc. v. Barient, Inc., 3 USPQ2d 1766, 1767 (Fed. Cir. 1987).

Gustavson et al. and Chang et al. fail to disclose each and every feature of the claimed invention, as required by 35 U.S.C. § 102(b), and provide no teaching that would have suggested the desirability of modification to include such features.

For example, Gustavson et al. fail to teach or suggest sensing an average current, as recited in claims 1, 4 and 6, or controlling current applied to a primary coil in a flyback transformer to cause the average current to follow a reference current, as recited in claims 1, 4 and 6.

The Gustavson apparatus does not sense average current, as recited in claims 1, 4 and 6. Indeed, the Gustavson apparatus controls current from the battery as a function of voltage, or as a function of "apparent current," which is a function of voltage measurements. E.g., Gustavson et al. col. 2, lines 42-45, 50-56; col. 3, lines 1-3; col. 4, lines 35-38, 43-45; col. 7, lines 1-3.

Gustavson et al. do not mention average current in any context. Nothing in Gustavson et al. describes or suggests sensing average current, as recited in claims 1, 4 and 6.

In addition, Gustavson et al. do not mention a reference current, as set forth in claims 1, 4 and 6, in any context. Nothing in Gustavson et al. describes or suggests controlling a current

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applied to a primary coil in a flyback transformer to cause the average current to follow a reference current, as recited in claims 1, 4 and 6. Nowhere does Gustavson et al. disclose or suggest that any reference current is used anywhere in the Gustavson apparatus, or that one current follows another current, as recited in claims 1, 4 and 6.

In contrast to Gustavson et al., Chang et al. mention average current coming from a battery applied to a primary transformer coil. Chang et al. col. 1, lines 63-68; col. 2 lines 22-27, 45-50; col. 4, line 67 to col. 5, line 3; col. 5, lines 15-20, 43-48. Chang et al., however, do not describe or suggest sensing this average current, as recited in claims 1, 4 and 6.

Furthermore, the average current of a Chang apparatus is not used as a parameter for controlling any other parameter. In particular, Chang et al. do not disclose or suggest that the average current follows a reference current, as recited in claims 1, 4 and 6. Chang et al. do not mention a reference current in any context, and do not describe controlling a current applied to a primary coil in a flyback transformer to cause the average current to follow a reference current.

Claim 1 is independent, and claims 4 and 6 depend on claim 1. Claim 1 is in condition for allowance, and therefore claims 4 and 6 are in condition for allowance as well.

Chang et al. and Gustavson et al. fail to disclose each and every limitation set forth in claims 1, 4 and 6. For at least these reasons, the Examiner has failed to establish a prima facie case for anticipation of Applicant's claims 1, 4 and 6 under 35 U.S.C. § 102(b). Withdrawal of these rejections is requested.

Claim Rejection Under 35 U.S.C. § 103

In the Office Action, the Examiner rejected claim 8 under 35 U.S.C. § 103(a) as being unpatentable over Chang et al. or Gustavson et al. in view of Sokal (U.S. Pat. No. 5,485,361). The Examiner asserted that it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the teachings of Chang et al. or Gustavson et al. to include sensing of the current through the primary and secondary coils as taught by Sokal as a means to monitor the current through the transformer in order to adjust the current to provide optimal charging.

Applicant respectfully traverses the rejection.

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In a proper obviousness determination, the prior art must give a reason or motivation for making the claimed invention. In re Lee, 61 USPQ2d 1430, 1433 (Fed. Cir. 2002). In re Lee emphasizes that evidence of motivation to combine references is not a trivial requirement, but is rather the best defense against a hindsight-based analysis. Id. In re Dembiczak, 50 USPQ2d 1614, 17 (Fed. Cir. 1999), underscores that combining prior art references without evidence of a suggestion, teaching or motivation to combine references simply takes the inventor's disclosure as a blueprint for piecing together the prior art to defeat patentability, and this is the "essence of hindsight." A rigorous application of the requirement for a showing of the teaching or motivation to combine is "the best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis." Id.

Furthermore, In re Lee and In re Dembiczak further emphasize the importance of creation of an evidentiary record that supports a conclusion of obviousness. In re Lee, 61 USPQ2d at 1433-34; In re Dembiczak, 50 USPQ2d at 1617. The findings must be based upon evidence in the record, not upon the subjective belief of the Examiner. See In re Lee, 61 USPQ2d at 1434 (the factual inquiry into whether to combine references "must be based on objective evidence in the record"); In re Dembiczak, 50 USPQ2d at 1617 ("The range of sources available, however, does not diminish the requirement for actual evidence.").

There is no evidence in the record that one skilled in the art would have been motivated to combine the apparatus of Sokal with the apparatus of Chang et al. or the apparatus of Gustavson et al. Furthermore, if one skilled had combined the apparatus of Sokal with the apparatus of Chang et al. or the apparatus of Gustavson et al., the claimed invention would not have resulted.

One of ordinary skill in the art would not have been motivated to modify a Chang apparatus or a Gustavson apparatus to sense current in the primary and secondary coils, because doing so is irrelevant to the operation of the Chang apparatus and the Gustavson apparatus. Chang et al. and Gustavson et al. were both concerned with current supplied by a battery to a primary coil. E.g., Chang et al. col. 2, lines 45-50; Gustavson et al. col. 2, lines 42-45. Neither Chang et al. nor Gustavson et al. suggest that sensing secondary coil current is relevant to the current supplied by the battery to the primary coil. In other words, sensing the current in the secondary coil would have no purpose in the Chang apparatus or the Gustavson apparatus.

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Sokal does not teach or suggest that sensing the current in the secondary winding has anything to do with the functions of the Chang apparatus or the Gustavson apparatus. Rather, Sokol describes monitoring primary and secondary winding currents to control switching time as a part of hysteretic current mode control: "The transistor 'on' time is controlled by peak-current-commanding control of the current in the transistor and the transformer primary winding. The transistor 'off' time is controlled by valley-current-commanding control of the capacitor-charging current in the capacitor and the secondary winding." Sokol col. 12, lines 61-67. Neither the Chang apparatus nor the Gustavson apparatus uses hysteretic current mode control.

Furthermore, adding hysteretic current mode control described by Sokol to a Chang apparatus or a Gustavson apparatus would not result in the invention as recited in claim 8, which uses average current as a feedback parameter.

As argued above, neither Chang et al. nor Gustavson et al. describe or suggest using average current as a feedback parameter. Neither Chang et al. or Gustavson et al. mention or suggest any reference current, or controlling a current applied to a primary coil in a flyback transformer to cause one current to follow another. Sokal likewise fails to teach or suggest this element. Sokal does not mention any reference current. Nor does Sokal describe controlling a current applied to a primary coil in a flyback transformer to cause currents sensed in the primary and/or secondary coils to follow another current.

For at least these reasons, the Examiner has failed to establish a prima facie case for non-patentability of Applicant's claim 8 under 35 U.S.C. § 103(a). Withdrawal of this rejection is requested.

Allowable Subject Matter

In the Office Action, the Examiner determined that claims 2, 3, 5, 7 and 9 recite allowable subject matter, and would be allowable if rewritten in independent form including all of the limitations of the base claim and intervening claims.

Claims 2, 3, 5, 7 and 9 depend directly or indirectly upon claim 1. Claim 1 is in condition for allowance for the reasons given above, and therefore claims 2, 3, 5, 7 and 9 are allowable without need for amendment.

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Rule 105 Request

The Examiner requested, pursuant to 37 C.F.R. § 1.105, that Applicant state what he means by “flyback transformer” and how it is different from a regular transformer.

First, Applicant submits that the term “flyback transformer” is well known to those of ordinary skill in the art of charging circuits. It is also well-known to those of ordinary skill in the art in other fields of electronics, such as switching regulators.

Second, Applicant finds it difficult to respond to the Examiner’s inquiry, in that it is not clear what the Examiner means by a “regular” transformer, and it is unclear whether the Examiner defines “regular” according to the structure of the transformer or according to how the transformer is used or both.

Transformers can have a variety of structural configurations. Transformers can have, for example, a variety of cores, or no core at all (i.e., an “air core”). The number of turns in the primary and secondary coils can vary from transformer to transformer. Some transformers have center taps and some do not. Some can handle very high voltages and some cannot. Different transformers have different potting. In a sense, each of these configurations is “regular” in the sense that each is fairly commonplace.

Applicant does not believe a flyback transformer—which is also quite commonplace—is limited to any particular structure, such as core type, potting type, and so forth. In other words, although some structural elements may be better for flyback applications than for other applications, Applicant does not believe that a flyback transformer must have a particular core configuration, or a particular number of coils, or a specific potting, or any other specific structure.

In general, “flyback” refers to the capacity of the transformer to manage energy. Generally speaking, a flyback transformer stores energy in the primary coil by routing a supply current through the primary coil to create a magnetic field. When the supply current is interrupted, the magnetic field collapses and the stored energy transfers to the secondary coil. In many typical transformer applications, by contrast, energy is generally transferred with less storage of energy in the primary coil.

Applicant hopes the above is helpful.

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CONCLUSION

All claims in this application are in condition for allowance. Applicant respectfully requests reconsideration and prompt allowance of all pending claims. Please charge any additional fees or credit any overpayment to deposit account number 50-1778. The Examiner is invited to telephone the below-signed attorney to discuss this application.

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17 May 2004
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